

FIG. 1A

DYNAMICALLY ADJUSTABLE  
DIGITAL GYRATOR HAVING  
EXTENDED FEEDBACK

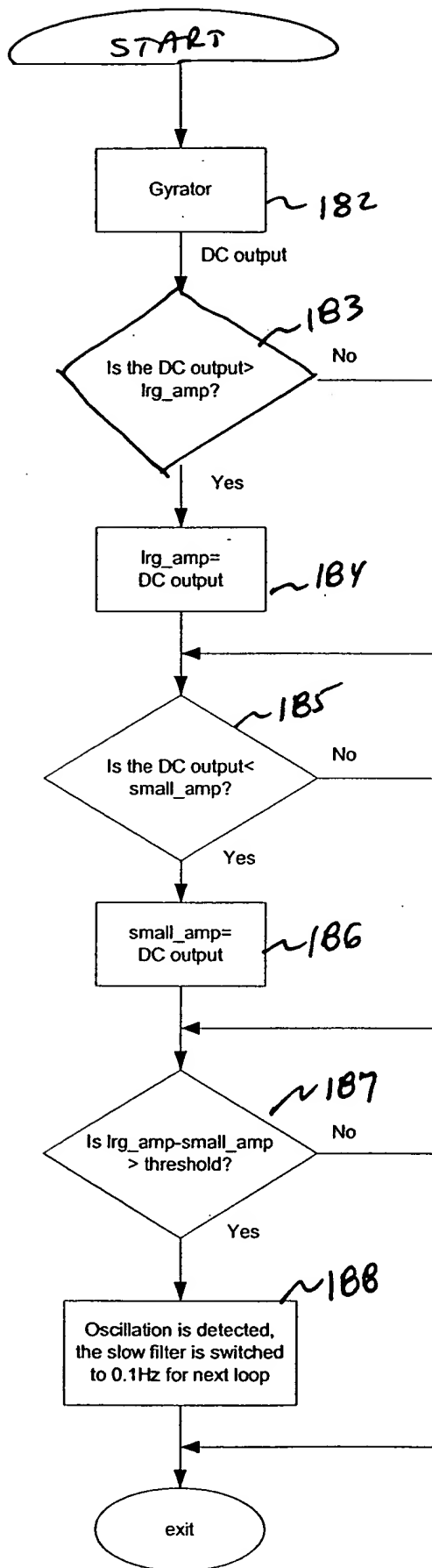
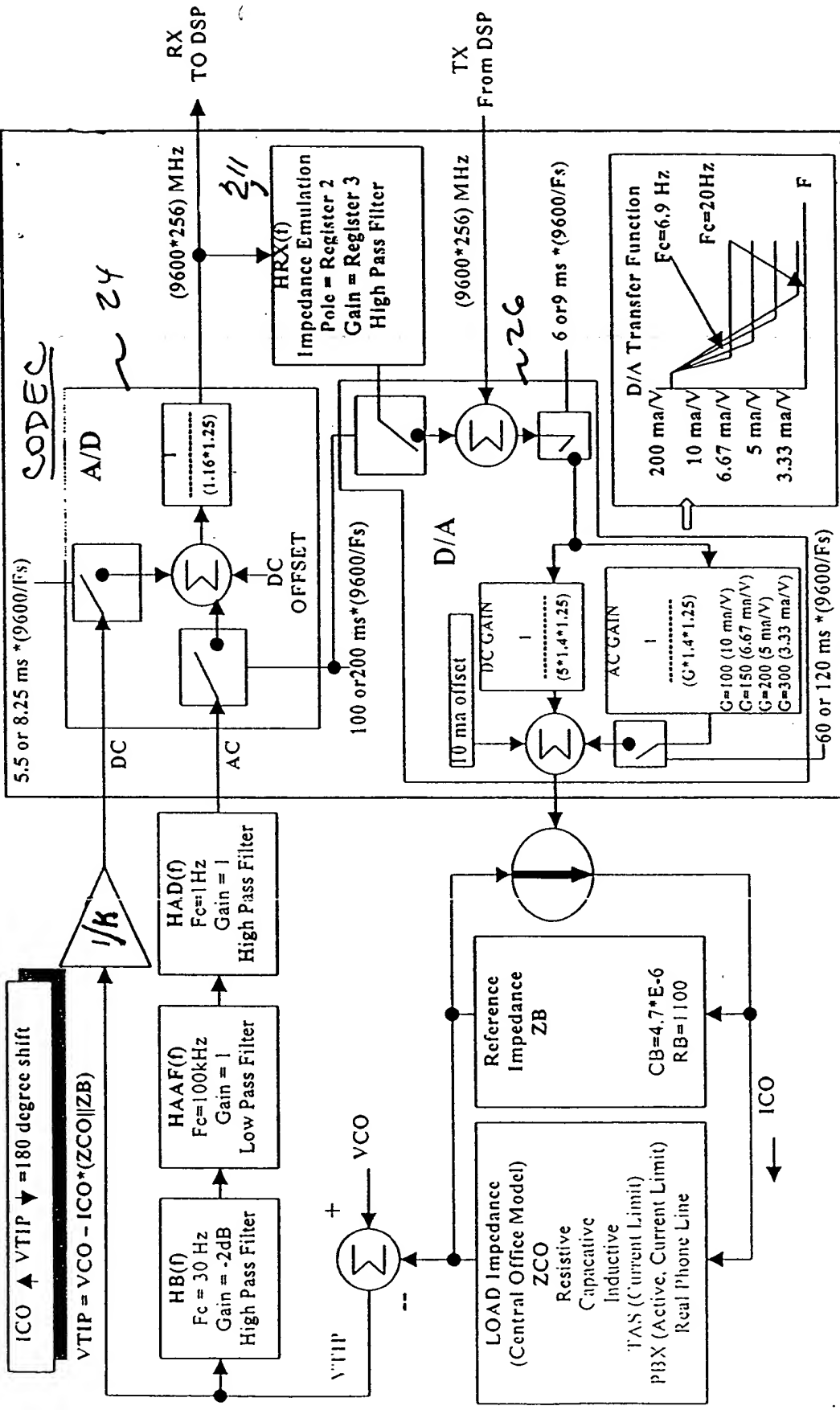


FIG. 1B

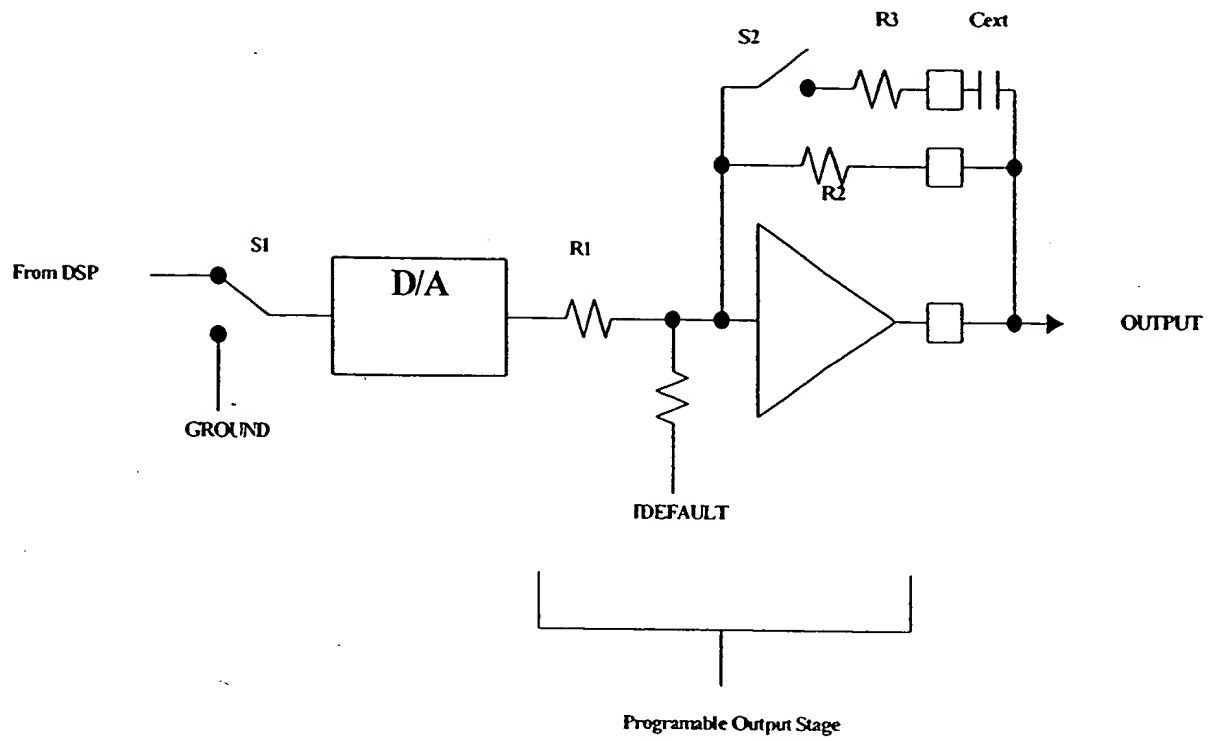


10



CODEC and Telephone System Stability Block Diagram

FIG. 3



Simplified D/A Path

FIG. 4



ADRNG = 1.16  
 DCDIV = 130  
 DCGN = 5  
 DAGN = 1.25  
 DARNG = 1.4  
 INTGN = .75

Input @ 4.6mV/LSB @TIP

$$1 / (.005 * 32768) = .00611 \text{ mA/LSB}$$

$$H(z) = \frac{\text{Input Gain}}{1 - \text{POLE} * Z^{-1}}$$

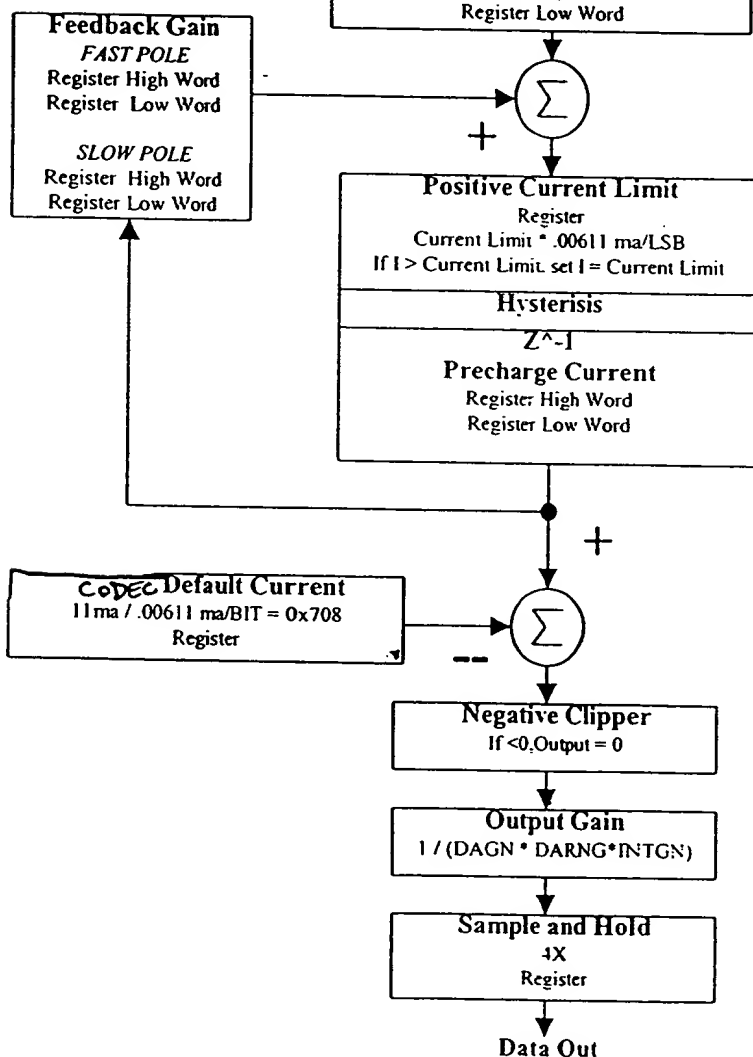


FIG. 6

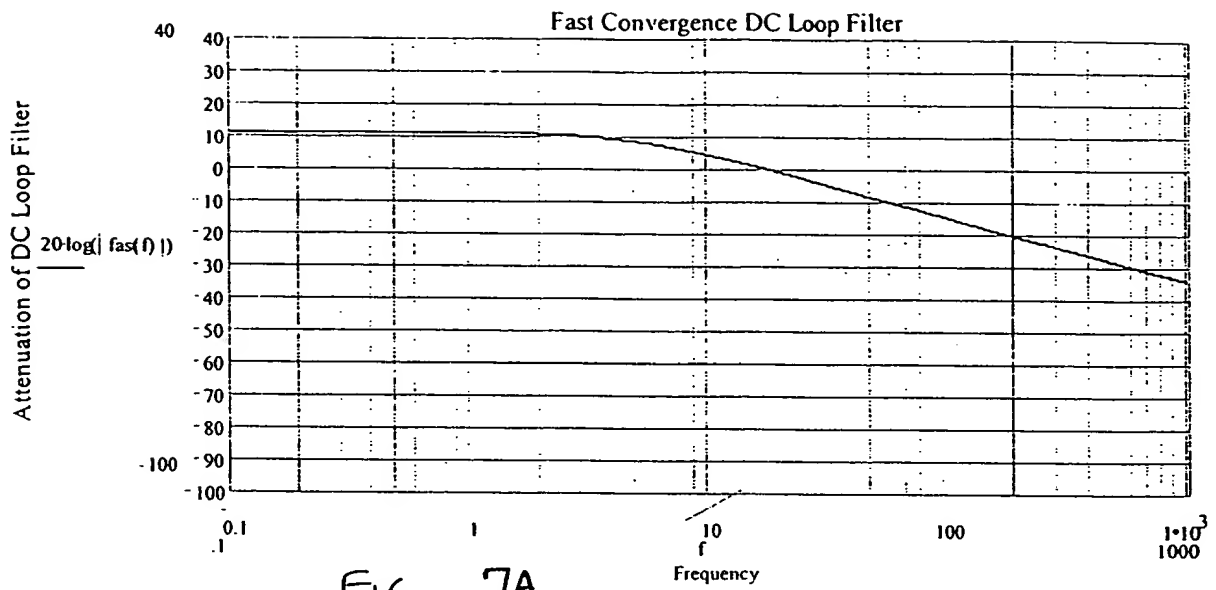


FIG. 7A

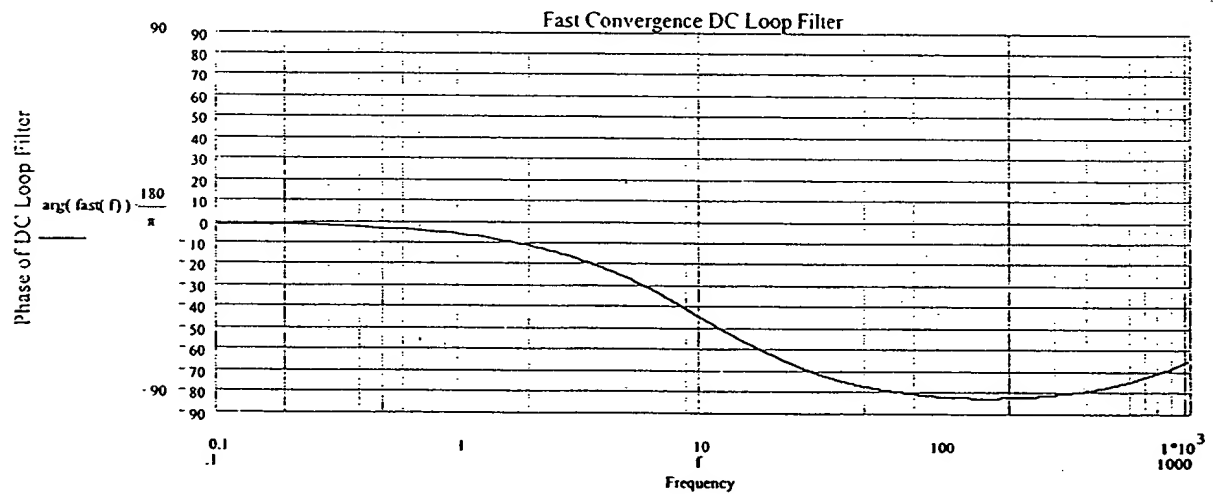


FIG. 7B

10 Hz Fast DC Loop Filter Gain and Phase



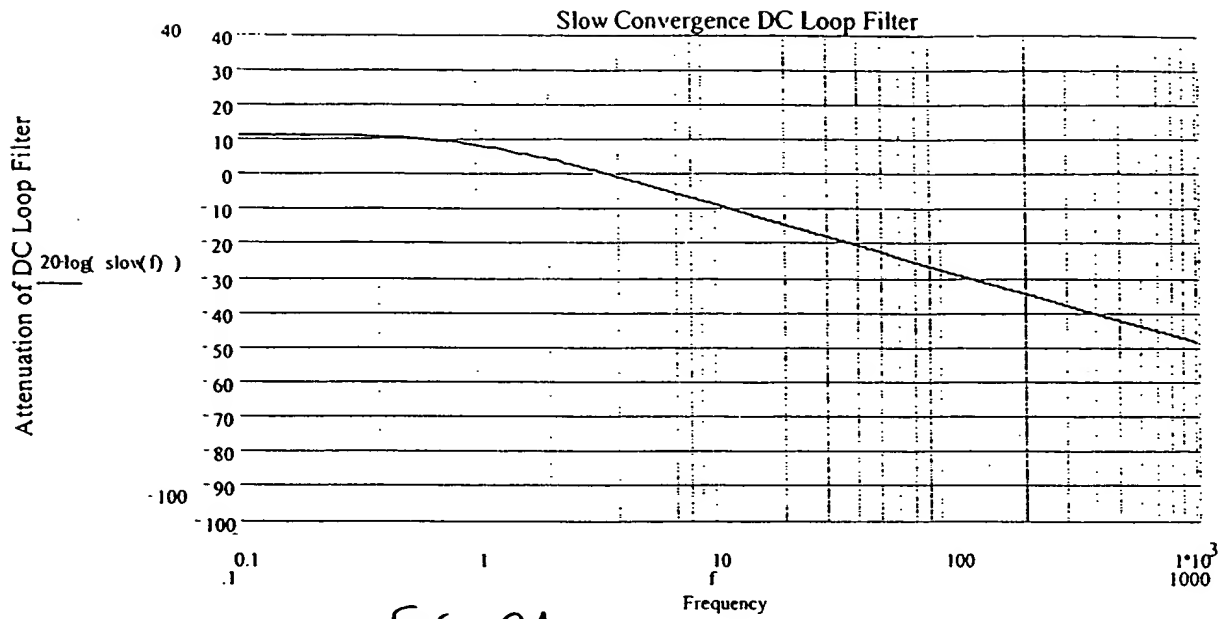


FIG. 8A

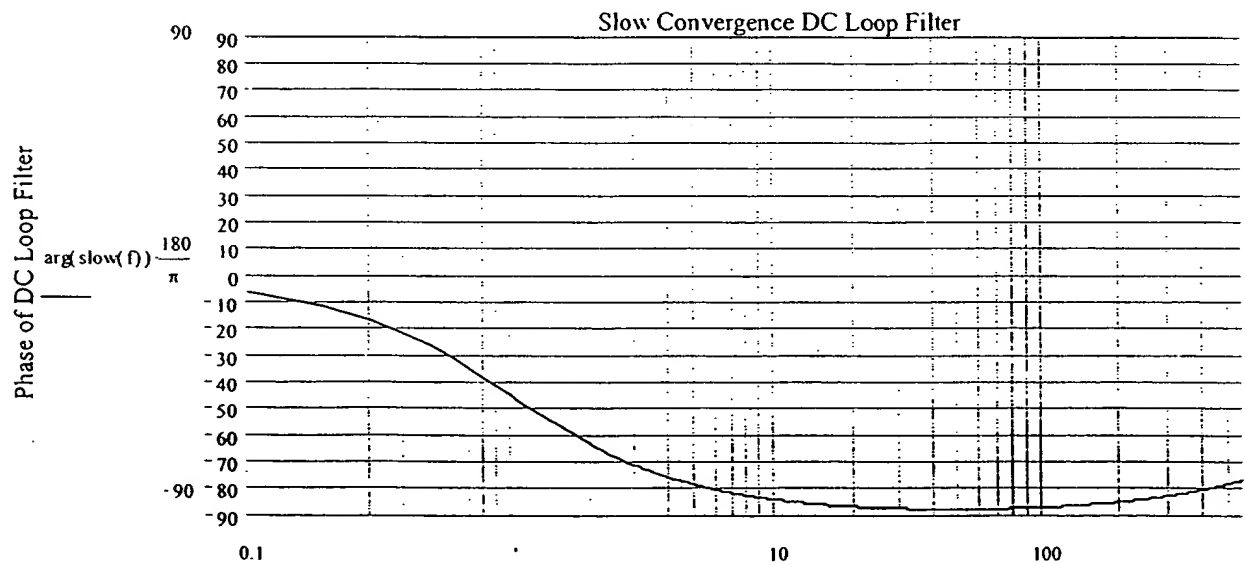
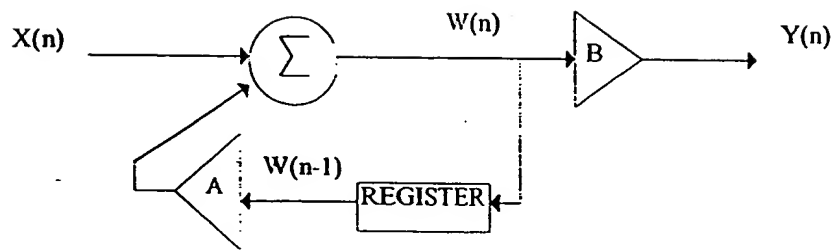


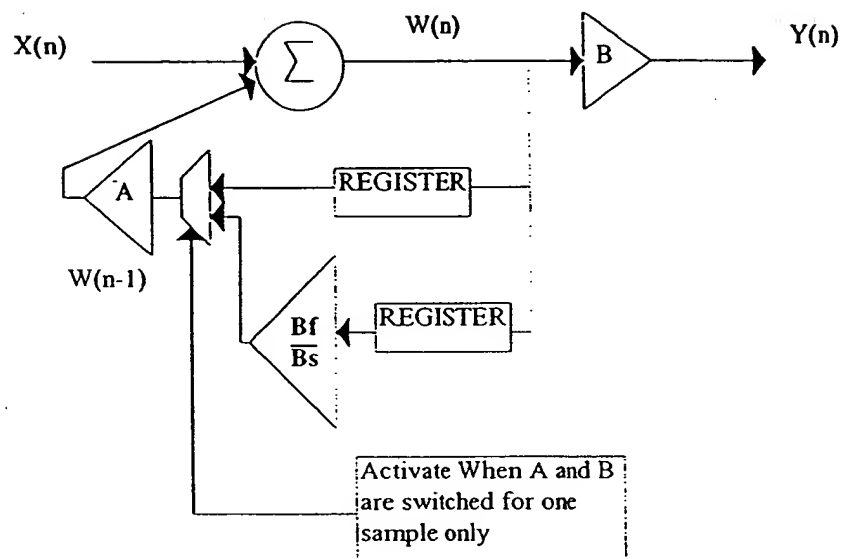
FIG. 8B

1 Hz Slow DC Loop Filter Gain and Phase



**First Order Filter Topology**

Fig. 9



**Final Low Pass Topology with glitch removed**

FIG. 10

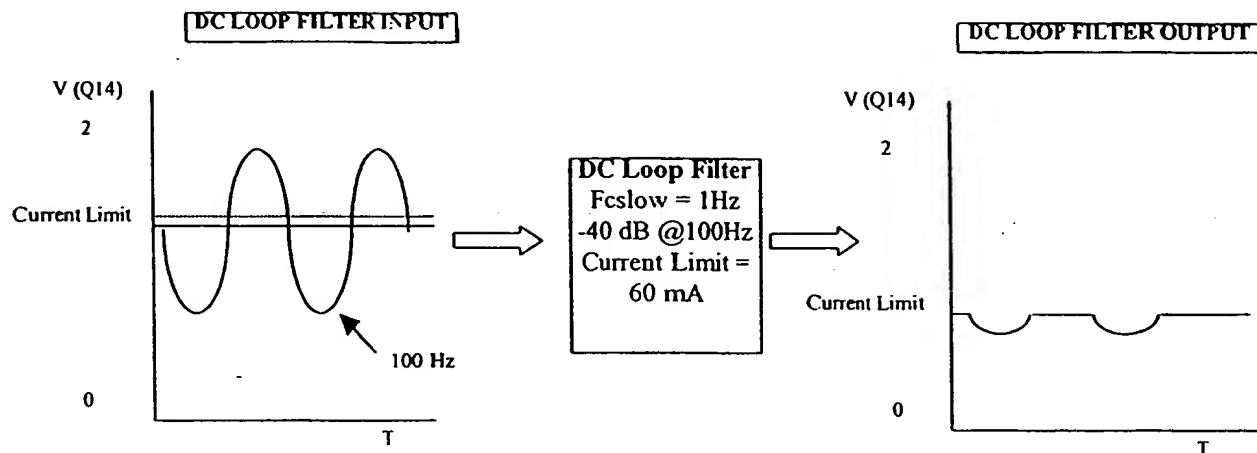


FIG. 11A

DC Loop Filter Without Hysteresis

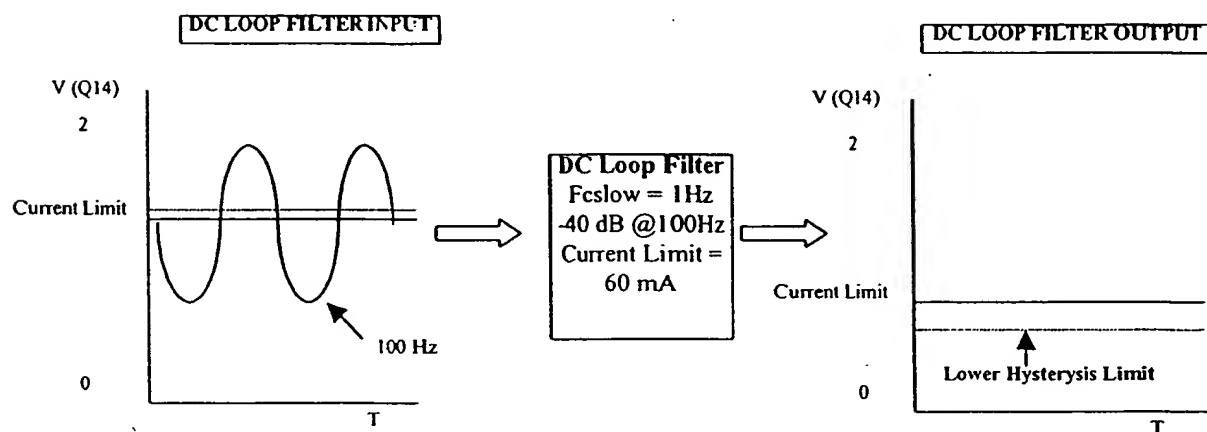


FIG. 11B

DC Loop Filter With Hysteresis

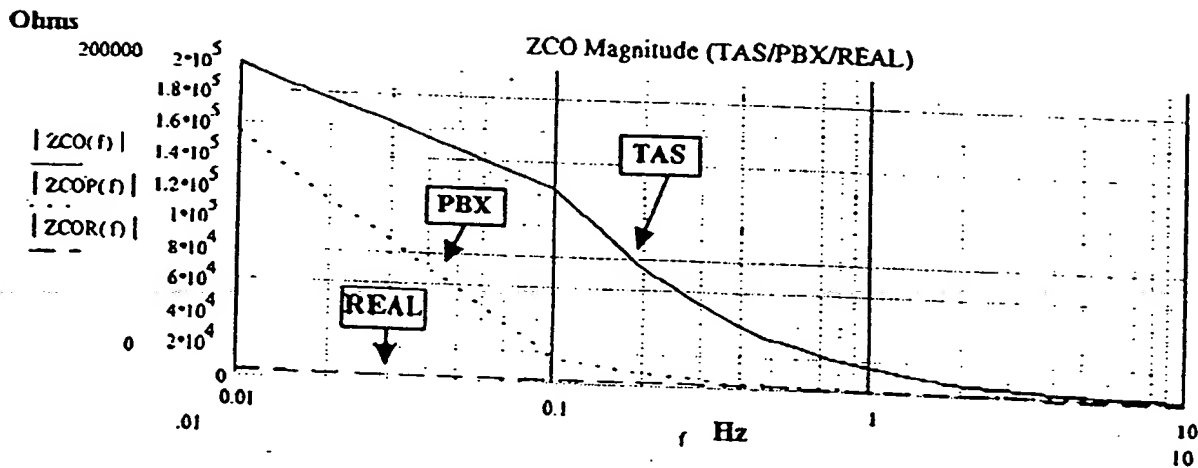


FIG. 12A

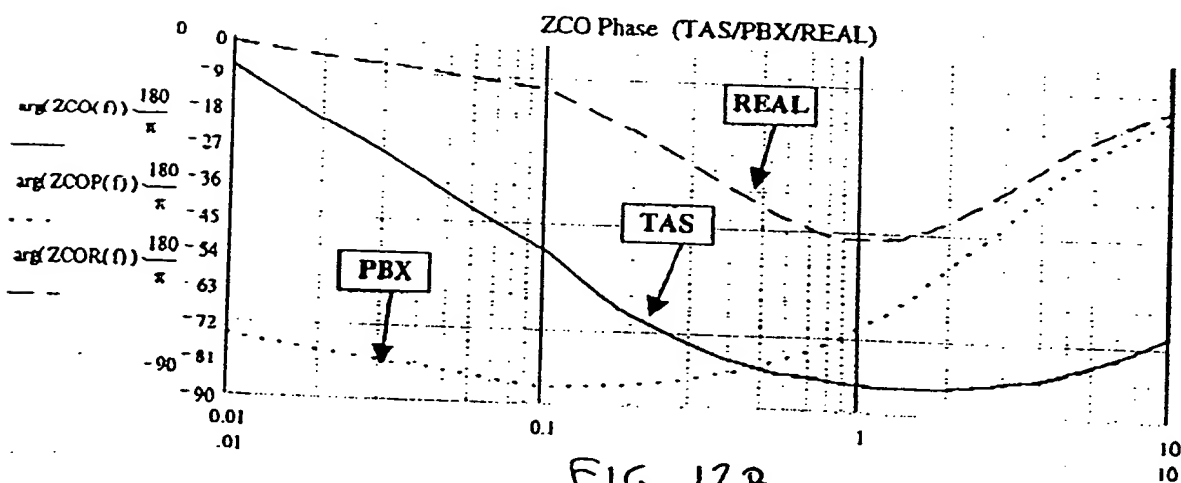


FIG. 12B

TAS, PBX and Real Phone Line V/I Loadlines

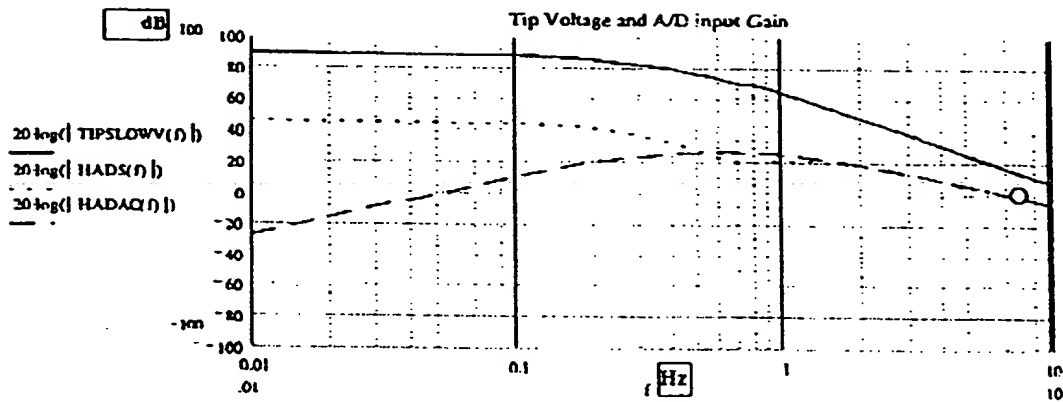


FIG. 13A

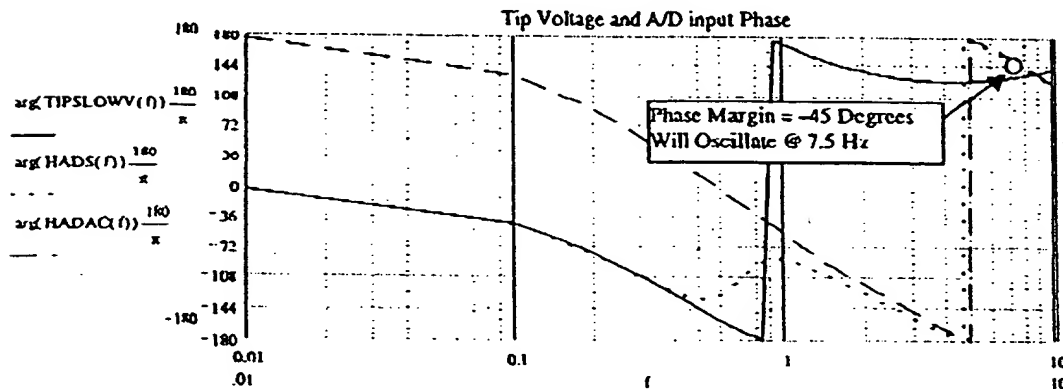


FIG. 13B

TAS Termination with Lowpass Filter Cutoff = 1 Hz

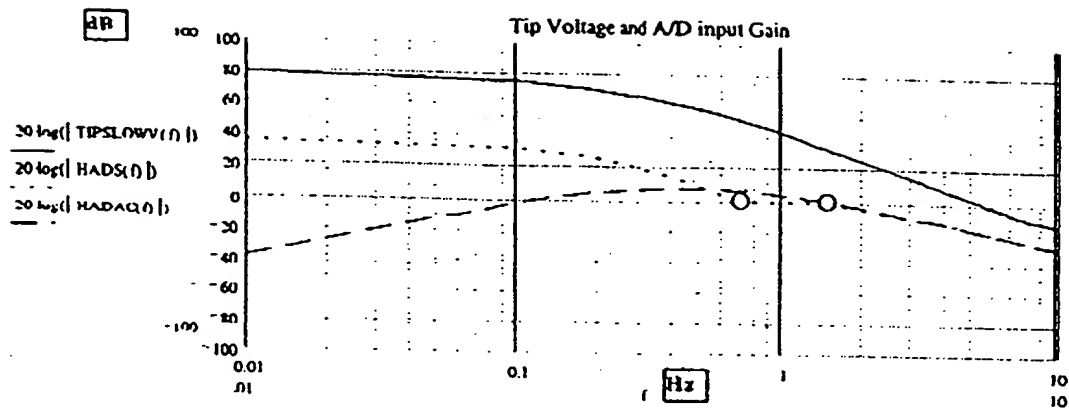


FIG. 14A

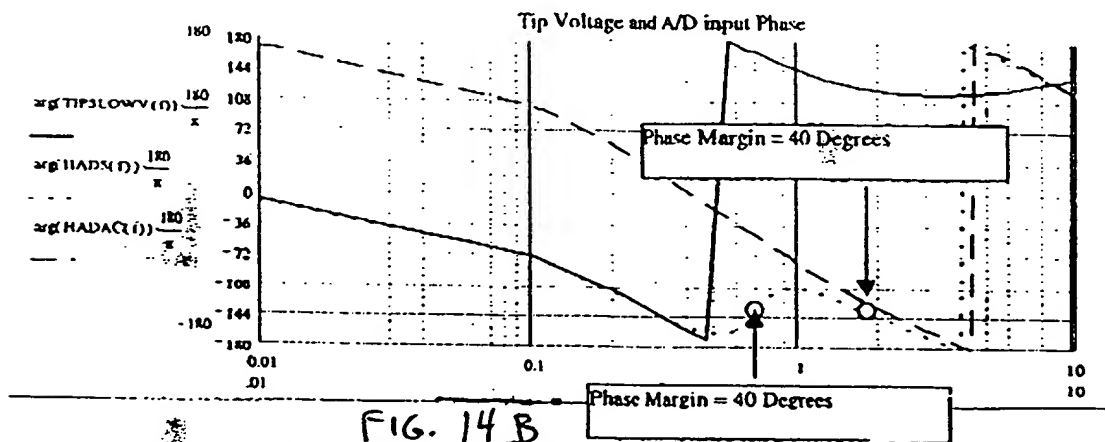


FIG. 14B

TAS Termination with Lowpass Filter Cutoff = .1 Hz

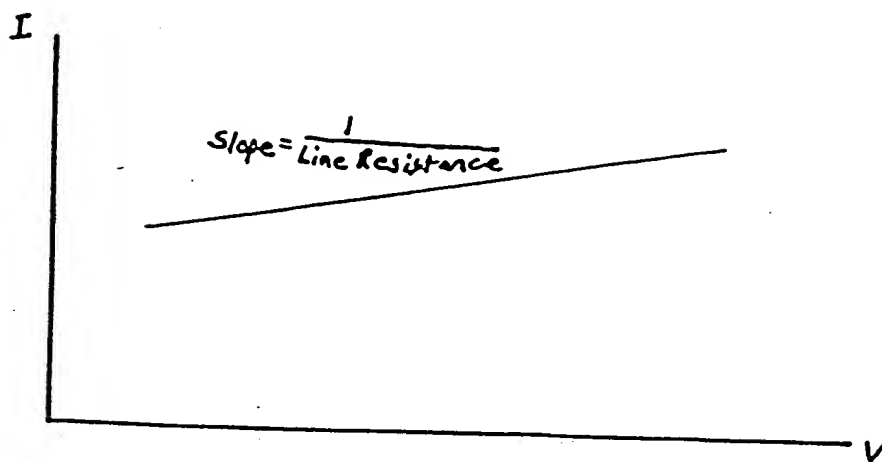


FIG. 15  
(PRIOR ART)

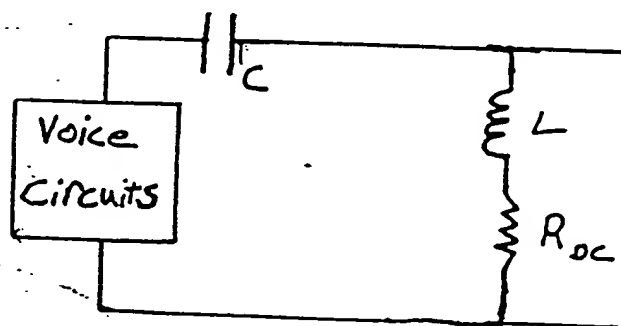


FIG. 16  
(PRIOR ART)

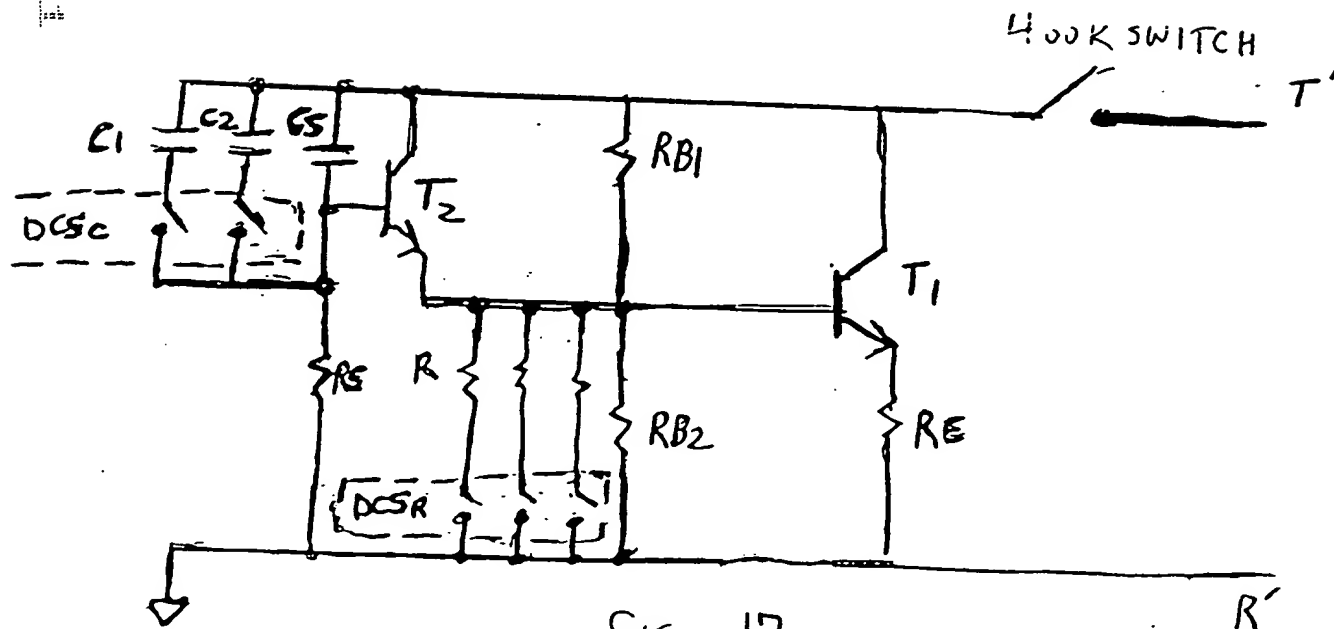
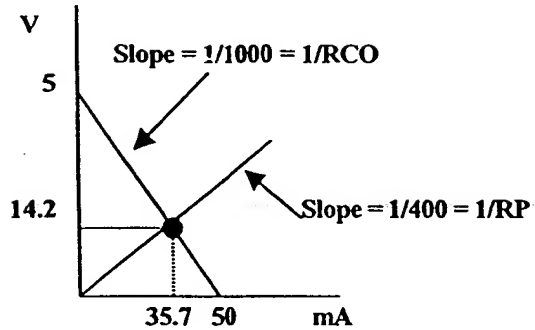


FIG. 17  
(PRIOR ART)



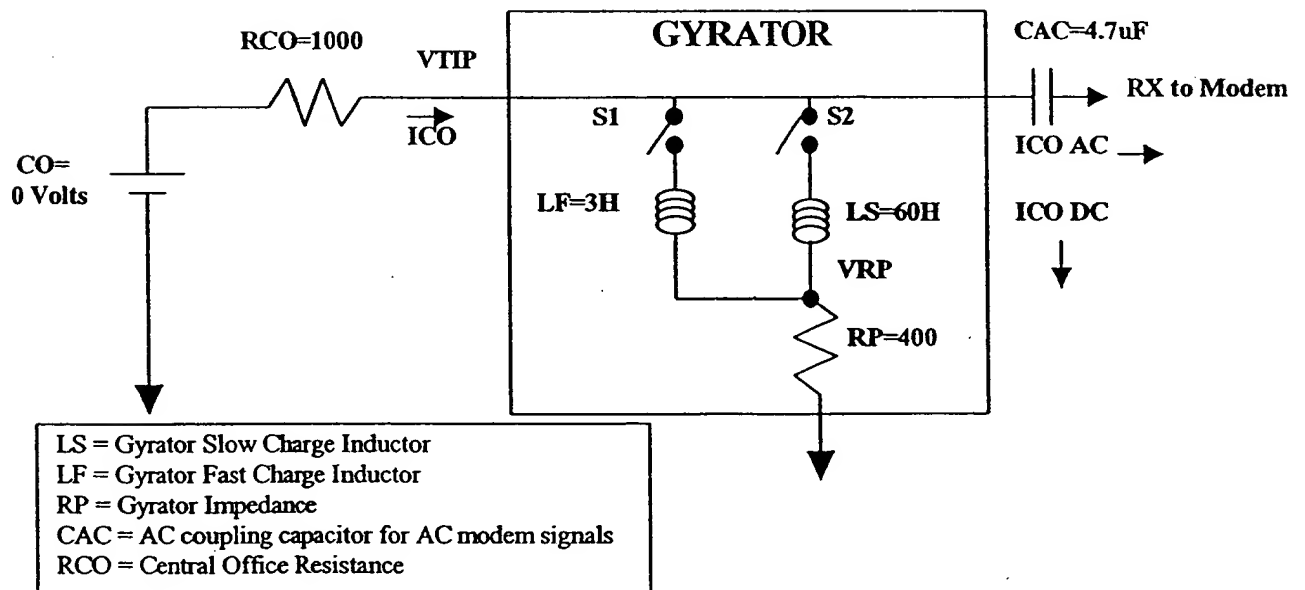
# V/I Loadline



$50 - ICO * RCO = ICO * RP = VTIP$   
 $ICO = 14.27 \text{ mA}$   
 $VP = 35.7 \text{ Volts}$   
 Note: All results are at steady state

PRIOR ART

FIG. 18A



Basic External Gyrator Example

FIG. 18B  
PRIOR ART